

### REMARKS

Claims 1-34 are pending in the application and stand rejected. The Applicants believe that, in view of the following remarks/arguments, the application is in condition for allowance.

#### Claim Rejection Under 35 U.S.C. § 102:

The Examiner has rejected claims 1-3, 5-11, 13-28, and 30 under 35 U.S.C. § 102(b) as being anticipated by US Patent Number 5,208,819 (hereinafter, Huber). The Applicants respectfully traverse the rejection.

In part (b) on page 2 of the Office Action, the Examiner has referred to “col.4,1.7” which is unclear.

#### Independent Claims 1, 11, 19, 23, and 30

Huber teaches a frequency stabilized optical signal source. A laser produces an optical carrier at a wavelength. Feedback is provided to adjust the wavelength. In order to provide the feedback, a portion of the optical carrier is modulated by a periodic reference signal. An optical fiber with an in-fiber resonator is coupled to receive the modulated optical carrier. The resonator effects a phase and/or amplitude change between the modulated optical carrier and a sideband thereof at a resonant frequency of the resonator. The phase or amplitude change is detected and used to adjust the laser wavelength. In a preferred embodiment, a moire grating having a single resonant frequency is used as the in-fiber resonator. The feedback scheme can lock either to the carrier frequency itself, or to a selected sideband of the modulated optical carrier. (Huber Abstract, emphasis added).

Huber fails to teach or suggest the structure recited in claims 1, 19, 23, and 30 and the parts of the method claim 11. The subject matter of claim 1 is similar to the subject matter of claims 11, 19, 23, and 30. As an illustration, the structure specifically recited in claim 1 is:

1. A laser system with self-injection locking, the laser system comprising:
  - (a) a single-frequency laser having a laser output for delivering laser light at a frequency  $\omega_0$ ;
  - (b) a modulator coupled to the output of the laser for generating two sidebands, the modulator being driven by a RF signal at a frequency  $\omega_m$ ;
  - (c) a filter coupled to an output of the modulator for suppressing or passing one of the two sidebands; and
  - (d) an optical path coupling an output of the filter to the laser for injection locking. (Emphasis added).

Applicants claim a system where a modulator is coupled to the output of a laser, a filter is coupled to an output of the modulator, together with an optical path coupling an output of the filter to the laser for injection locking. Therefore, the Applicants' disclosure is for an apparatus that operates in the optical domain for injection locking.

Huber is completely devoid of a teaching or suggestion of an optical path, as claimed by Applicants, for coupling an output of the filter to the laser for injection locking. The Applicants' claims are free from a need to detect an optical signal, and a need to perform signal processing in the electrical/microwave domain. Please see Huber's distinct teaching in Column 4, lines 25-30, as reproduced below:

The detection of the phase change for use as a feedback signal is illustrated in FIG. 1. In particular, the optical resonator output is detected from an end of fiber 16 by a conventional optical detector 20, which converts the detected signal to the electrical domain. (Emphasis added).

Therefore, Huber does not disclose the feature “an optical path coupling an output of the filter to the laser for injection locking” of claim 1.

Further, Huber generates a feedback by control circuitry 40 in FIG. 1 of Huber. Huber may teach optical fiber 16 but it ends at the optical detector 20 in FIG. 1. Here the optical energy must undergo detection and amplification for becoming usable by the block  $\lambda$  control 40 as  $A\cos\Phi$  and  $A\sin\Phi$ . The optical fiber 16 does not reach laser 10 at all as illustrated in Huber FIG. 1. The control circuitry 40 functions in an electrical or RF domain as described in Huber’s Column 4, lines 52-63, as reproduced below:

This phase change is detected by the RF mixers 26, 28 and output, as noted above, as  $A\sin\Phi$  and  $A\cos\Phi$ . The phase is recovered in a conventional manner by control circuitry 40 as

$$\Phi = \tan^{-1}[A\sin\Phi/A\cos\Phi]$$

Circuitry 40 provides a wavelength control signal to laser 10 based on the phase shift detected by the heterodyne detector. (Emphasis added).

Therefore, Huber does not disclose the feature “an optical path coupling an output of the filter to the laser for injection locking” of claim 1.

Similarly, claim 11 recites the feature “feeding the shifted optical signal back into the input of the distributed feedback laser” not disclosed in Huber. Claim 19 recites the feature “an optical path coupling an output of the filter to the laser for injection

locking” not disclosed in Huber. claim 23 recites the feature “an optical path for coupling an output of the filter to the laser for injection locking the laser” not disclosed in Huber. Claim 30 recites the feature “an optical path coupling an output of the filter to the laser for injection locking” not disclosed in Huber.

Accordingly, Applicants respectfully submit that all of the independent claims 1, 11, 19, 23, and 30, are not anticipated by Huber. The Examiner is requested to allow these claims.

If the Examiner does not agree with Applicants’ statement, Applicants respectfully request that the Examiner comply with 37 CFR 1.104(c)(2) and “designate as nearly as practicable” where Huber discloses an optical path coupling an output of the filter to the laser for injection locking. Otherwise, the rejection of claims 1, 11, 19, 23, and 30 should be withdrawn as requested above.

Claims depending from these independent claims, reciting additional features, are also allowable at least for the reasons stated above. Therefore, the Examiner is respectfully requested to allow all of the dependent claims as well.

Claim Rejection Under 35 U.S.C. § 103:

The Examiner has rejected dependent claims 4, 12, 29, and 31-34 under 35 U.S.C. § 103(a) as being unpatentable over various combinations of references which include Huber. The Applicants respectfully traverse the rejection.

As stated above, all of the independent and dependent claims are already in allowable form with respect to Huber. Therefore, claims 4, 12, 29, and 31-34, are patentably unobvious with respect to the references cited in combination with Huber.

Therefore, the Examiner is respectfully requested to withdraw the rejection and allow claims 4, 12, 29, and 31-34 as well.

In view of the above, the Applicants submit that the application is now in condition for allowance and respectfully urges the Examiner to pass this case to issue.

The Commissioner is authorized to charge any additional fees that may be required or credit overpayment to deposit account no. 12-0415. In particular, if this response is not timely filed, the Commissioner is authorized to treat this response as including a petition to extend the time period pursuant to 37 CFR § 1.136(a) requesting an extension of time of the number of months necessary to make this response timely filed and the petition fee due in connection therewith may be charged to deposit account no. 12-0415.

I hereby certify that this response is being electronically filed with the USPTO on

November 6, 2007

(Date of Transmission)

Lonnie Louie

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11/6/07

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Respectfully submitted,

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